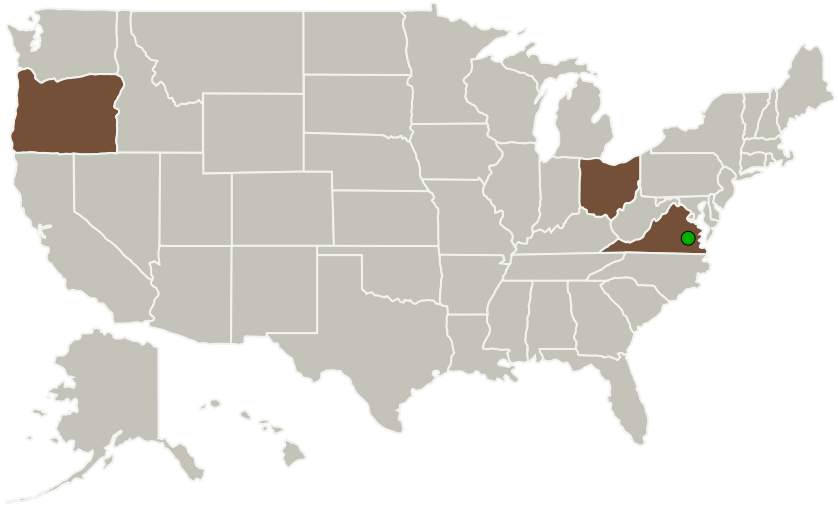
# Highly Sensitive Flash LADAR Camera, Phase II

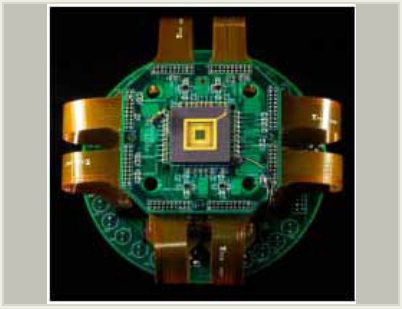
Completed Technology Project (2016 - 2019)

## Project Introduction

To address the urgent need for 3D flash-lidar technology for landing on solar system bodies and for spacecraft rendezvous and docking with satellites, an effort is proposed to fabricate, characterize, and test a versatile, high-sensitivity InGaAs APD 3D flash lidar and to advance the technology-readiness level (TRL) of lidar technologies suitable for NASA mission requirements. Leveraging an existing InGaAs APD focal-plane array (FPA) technology, improvements will be made to increase its reliability and performance. The high-gain, low-excess-noise APD FPAs will be characterized and integrated with miniature camera electronics, along with a medium-pulse-energy, high-repetition-rate, ultra-compact, pulsed diode-pumped solid-state (DPSS) laser. The lidar sensor will be shown to meet NASA needs in terms of sensitivity and 5-cm range resolutions. Using these results, a large-format (e.g. 1024 x 1024, or larger) FPA will be designed for qualification for space missions.

## Primary U.S. Work Locations and Key Partners





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| Organizations Performing Work | Role | Type | Location |
|---|---|---|---|
| Voxtel, Inc. | Lead Organization | Industry | Beaverton, Oregon |
| Langley Research Center(LaRC) | Supporting Organization | NASA Center | Hampton, Virginia |
| University of Dayton | Supporting Organization | Academia | Dayton, Ohio |

| Primary U.S. Work Locations | |
|---|---|
| Ohio | Oregon |
| Virginia | |

## Project Transitions

**September 2016:** Project Start

**March 2019:** Closed out

**Closeout Documentation:**

- Final Summary Chart*(https://techport.nasa.gov/file/140807)*

## Organizational Responsibility

**Responsible Mission Directorate:**

Space Technology Mission Directorate (STMD)

**Lead Organization:**

Voxtel, Inc.

**Responsible Program:**

Small Business Innovation Research/Small Business Tech Transfer

## Project Management

**Program Director:**

Jason L Kessler

**Program Manager:**

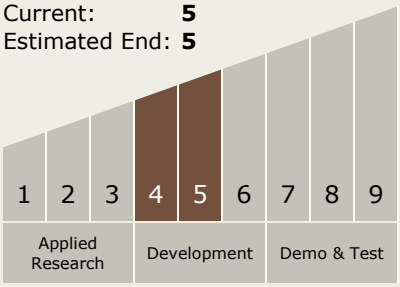
Carlos Torrez

**Principal Investigator:**

Drake Miller

## Technology Maturity (TRL)

Start: **4**
Current: **5**
Estimated End: **5**



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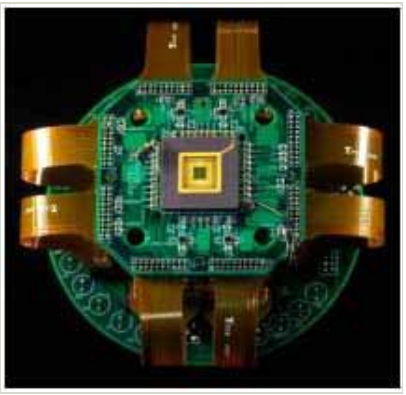
## Images



**Briefing Chart Image**
Highly Sensitive Flash LADAR Camera, Phase II
*(https://techport.nasa.gov/image/130180)*

**Final Summary Chart Image**
Highly Sensitive Flash LADAR Camera, Phase II
*(https://techport.nasa.gov/image/126064)*

## Technology Areas

**Primary:**

- TX09 Entry, Descent, and Landing
  - TX09.3 Landing
    - TX09.3.1 Touchdown Systems

## Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System